

Quest for a phantom—the search for the winter quarters of the Aquatic Warbler *Acrocephalus paludicola*

Volker Salewski^a, Bruno Bargain^b, Ibrahima Diop^c and Martin Flade^d

À la recherche des quartiers d'hivernage du Phragmite aquatique *Acrocephalus paludicola*. Le Phragmite aquatique *Acrocephalus paludicola* est une espèce globalement menacée qui niche en Europe centrale et de l'est, ainsi que dans l'ouest de la Sibérie. Il migre via l'Europe de l'ouest vers l'Afrique sub-saharienne, mais ses quartiers d'hivernage étaient largement inconnus, avec seulement 32 données de novembre à février en Afrique. Pour mettre en place des stratégies de conservation pour des oiseaux migrateurs, il est nécessaire de prendre en compte l'ensemble des habitats utilisés durant un cycle annuel. En février 2007, l'AWCT a organisé une mission au Parc National du Djoudj, au Sénégal, où 19 personnes de dix pays européens ont été rejointes par 20 ornithologues sénégalais et mauritaniens. En deux semaines, 56 Phragmites aquatiques ont été capturés et d'autres observés. Avec ce résultat inespéré, l'expédition a découvert une importante zone d'hivernage pour l'espèce. À l'avenir, les contrôles de bagues, l'analyse des isotopes et des échantillons de sang, ainsi que l'étude des habitats utilisés par l'espèce devraient aider à localiser de nouveaux sites d'hivernage en Afrique de l'ouest et dynamiser la coopération internationale pour la conservation de cet oiseau.

Summary. Aquatic Warbler *Acrocephalus paludicola* is a globally threatened species which breeds in central and eastern Europe and in western Siberia. It migrates, via Western Europe, to sub-Saharan Africa, but its precise wintering grounds were hitherto unknown, with only 32 published records between the months of November to February from Africa. To develop conservation strategies for migratory bird species, all habitats used throughout the annual cycle must be considered. In February 2007 the AWCT led an expedition to Djoudj National Park, Senegal, where 19 members of the AWCT from ten European countries were joined by 20 ornithologists from Senegal and Mauritania. Fifty-six Aquatic Warblers were mist-netted and more observed in two weeks. With this unexpected result, the expedition had discovered an important wintering area of the species. In the future, ring recoveries as well as the analyses of isotopes of plucked feathers, blood samples and habitats used will help to indicate more potential sites where Aquatic Warblers may spend the non-breeding season in West Africa, and will stimulate further international cooperation for the species' conservation.

Aquatic Warbler *Acrocephalus paludicola* is the only globally threatened passerine bird species found in continental Europe (BirdLife International 2004). Formerly widespread in all mires and riverine wetlands of eastern and central Europe, and with a distribution reaching as far west as northern France, Belgium and the Netherlands, the species' decline had already commenced in the 18th century with the first large-scale drainage activities for agricultural purposes. Aquatic Warbler became extinct as a breeder in France and Belgium as early as the 19th century. In the Czech Republic the last Aquatic Warblers bred in the early 1900s. In Austria the species bred until the 1920s, in the Netherlands until the 1940s and in Italy until the 1950s or

1960s. During this period populations in the former Yugoslavia, Romania and Bulgaria probably also vanished (Schulze-Hagen 1991). In other parts of Central Europe populations also declined rapidly: in western Germany the species became extinct in the 1960s, but there were *c.*10 singing males in the extreme north-east of the country in 2007 (Tanneberger *et al.* in press). These birds belong, along with the birds on the Polish side of the River Oder, to the smallest of the four currently known, isolated, breeding populations, namely that restricted to Pomerania which totalled approximately 80 singing males, at seven sites, in 2007 (Tanneberger *et al.* in press). This population is declining rapidly and will probably become extinct soon, if the current trend continues (Flade

et al. 2006). A larger population, in the Hortobágy region of Hungary, showed a continuous upward trend after the first singing males—c.20—were discovered there in the early 1970s. However, since 2001 the population has collapsed from c.700 singing males to 60 in 2006 (Z. Végváry pers. comm.). The largest of the four known populations is found in Lithuania, Belarus, East Poland and Ukraine. There, up to 7,000 singing males occur in the Zvanets mire, Belarus, alone, and the total Central European population is estimated to comprise c.17,000 singing males. The fourth population, discovered in 2000 in west Siberia, is isolated by 4,000 km. It comprises c.50–500 singing males (Flade in prep.). The total world population of Aquatic Warblers is estimated to number c.18,000 males at fewer than 40 regular breeding localities in eight European countries, with four sites supporting over 80% of the world population (AWCT data base, Flade in prep.). The species is, therefore, the rarest breeding passerine in continental Europe and is listed as Vulnerable in the IUCN Red List of Threatened Species. At the European level, it is classified as Endangered (BirdLife International 2004) and the species is also included in Annex I of the EU Wild Birds Directive on the Conservation of Wild Birds, in Appendix II of the Bern Convention on the Conservation of European Wildlife and Natural Habitats and in Appendix I of the Bonn Convention on the Conservation of Migratory Species of Wild Animals.

Coordinating conservation activities on the breeding grounds

The rapid decline of Aquatic Warbler populations by c.95% within a century (AWCT 1999, BirdLife International 2004) led to concerns that the species may face extinction in the near future, although an expedition organised by M. Flade to Belarus in 1995, to confirm that the species was extinct there succeeded in discovering the largest known breeding population (AWCT 1999). The deteriorating situation led to international action in 1998, when the 'Aquatic Warbler Conservation Team' (AWCT) was founded at Brodowin, Germany, under the auspices of BirdLife International. The AWCT represents an informal association of researchers and conservationists working on the Aquatic Warbler, from all breeding-range states, some stopover and one win-

tering country, respectively. Currently, ornithologists from 11 European countries and Senegal are involved.

The AWCT organises at least one annual meeting and has undertaken 14 field expeditions to different parts of west Siberia, Belarus, Ukraine, Latvia, Lithuania, European Russia, Poland and Hungary. During these expeditions, the AWCT has explored nearly the entire former central and east-European, as well as the Siberian, breeding range of the Aquatic Warbler, in search of remain-

Captions to photos on opposite page

Figure 1. Some members of the Aquatic Warbler Conservation Team (AWCT) in search for Aquatic Warblers *Acrocephalus paludicola*, February 2007 (Volker Salewski)

Quelques membres de l'Equipe de Conservation du Phragmite aquatique (AWCT) à la recherche du Phragmite aquatique *Acrocephalus paludicola*, février 2007 (Volker Salewski)

Figure 2. Aquatic Warbler *Acrocephalus paludicola* habitat in Djoudj National Park, Senegal, February 2007 (Volker Salewski)

Habitat du Phragmite aquatique *Acrocephalus paludicola* dans le Parc National du Djoudj, Sénégal, février 2007 (Volker Salewski)

Figure 3. Senegal ornithologist Ibrahim Gueye with the first Aquatic Warbler *Acrocephalus paludicola* mist-netted by the AWCT in Senegal, 25 January 2007 (Martin Flade)

L'ornithologue sénégalais Ibrahim Gueye avec le premier Phragmite aquatique *Acrocephalus paludicola* capturé par l'AWCT au Sénégal, 25 janvier 2007 (Martin Flade)

Figure 4. The AWCT team discovered an important non-breeding area of Baillon's Crake *Porzana pusilla* in Djoudj National Park, February 2007 (Volker Salewski)

L'équipe AWCT a découvert une importante zone d'hivernage de la Marouette de Baillon *Porzana pusilla* dans le Parc National du Djoudj, février 2007 (Volker Salewski)

Figure 5. The melanistic form of Montagu's Harrier *Circus pygargus* is encountered regularly in Djoudj National Park, February 2007 (Volker Salewski)

La forme mélanique du Busard cendré *Circus pygargus* est rencontrée régulièrement dans le Parc National du Djoudj, février 2007 (Volker Salewski)

Figure 6. The rare Little (Kurrichane) Buttonquail *Turnix sylvaticus* was recorded by the AWCT, February 2007 (Volker Salewski)

Le rare Turnix d'Andalousie *Turnix sylvaticus* à été observé par l'AWCT, février 2007 (Volker Salewski)



ing populations, has taken DNA and feather samples of most subpopulations, developed joint standard methods for monitoring, habitat description and field research, and has initiated the Aquatic Warbler Memorandum of Understanding under the Bonn Convention for the Conservation of Migratory Animals (2003, Minsk).

With the Pripyat marshes in Belarus and Ukraine, the population in the Hortobágy National Park, Hungary and other regions in eastern-central Europe (Biebrza and Chelm marshes in Poland, Supoy and Uday marshes in central Ukraine), the majority of Aquatic Warblers breed in protected areas (AWCT 1999) and, at least in the near future, the species' breeding habitats appear safe. However, Aquatic Warblers are long-distance migrants and populations of migratory birds may be affected by conditions or factors operating on migration or in the winter quarters (see Salewski & Cresswell in prep.). Therefore, long-term conservation strategies must consider all habitats, regions and conditions used by a migratory species throughout its annual cycle, and require collaboration by conservationists from different countries (Bibby 2003). A precondition for the development of such a strategy is knowledge of the migration routes, the areas where the non-breeding season is spent, and the habitats used on migration and in winter, but the precise wintering grounds of Aquatic Warblers were hitherto unknown (Schulze-Hagen 1991, AWCT 1999).

Where are the winter quarters?

The AWCT has run several desk studies aimed at narrowing down the potential wintering range of the species. Schäffer *et al.* (2006) reviewed all available information concerning the migration routes and winter quarters. Aquatic Warblers depart their breeding grounds between late June and mid August, migrating west and south-west through Western Europe (Germany, the Netherlands, Belgium, France) and Iberia to north-west Africa (Julliard *et al.* 2006). There are nine records from Morocco in August–October, after which the species seems to 'vanish' almost completely until it reappears in northern Africa in spring (44 records from Morocco, Algeria and Tunisia in February–May). There were only 16 records (of at least 19 individuals) of Aquatic Warblers in November–January from four countries in sub-Saharan Africa: Mauritania (4),

Senegal (6), Mali (5) and northern Ghana (1). There are a further 16 records from February, including some from northern Africa (Egypt: 1, Algeria: 1, Morocco: 7). This is an astonishingly small number of records given that, despite the species' status, thousands of birds migrate annually to Africa. Therefore, knowledge of the winter quarters was far from sufficient to draw conclusions concerning habitat requirements and potential threats in Africa. The few observations, however, suggested that the species probably winters in similar habitats (freshwater marshes, wet meadows, floodplains) compared to the breeding grounds. Because wetlands throughout Africa face threats from agricultural development, as well as on the breeding grounds in Europe (AWCT 1999), more research was urgently needed to locate the Aquatic Warbler's staging areas in Africa.

The activities of the AWCT included two analytical studies: (1) a project to study migratory connectivity of Aquatic Warblers using stable isotopes, which has resulted in identification of the probable wintering sites in Senegal, Mauritania and Mali (D. Pain pers. comm.). (2) A further study modelled the potential wintering areas using all previous observations (Walther *et al.* in press). The latter study came to more conservative conclusions concerning the suggested winter quarters, ranging from northern Senegal south to The Gambia, and through southern Mauritania, Mali and Burkina Faso west to northern Benin, southern Niger and western Nigeria. However, in coincidence with the isotope study (Pain *et al.* 2004), this study suggested that all known populations of Aquatic Warblers winter in West Africa.

Quest for a phantom—the AWCT in Senegal

Limited evidence suggested that Aquatic Warblers winter exclusively in wetlands within savanna habitats. Furthermore, there were substantial indications that a major wintering site was situated in the Senegal River estuary (Morel & Roux 1973, Rodwell *et al.* 1996). In contrast, an expedition by Spanish ornithologists failed to find any Aquatic Warblers in the Inner Niger Delta, in Mali, in December 2006 (C. Z. Martinez pers. comm.).

To protect Aquatic Warblers in all regions and habitats throughout its annual cycle the AWCT has been searching for partners in Africa since its foundation. Such a partner was found with

Ibrahima Diop, the Director of the Parc National des Oiseaux du Djoudj in northern Senegal. Senegal is also the only African country, to date, to have signed the international memorandum for the protection of the Aquatic Warbler. In this memorandum, the countries agreed to implement measures to protect Aquatic Warblers according to an action plan and to report on progress every three years. The first meeting of the signatory parties was in 2006. During this conference highest priority was given to search for Aquatic Warblers in West Africa. In January 2007, 19 members of the AWCT from ten different European countries visited Djoudj National Park, where they joined 18 Senegalese colleagues. During several days, two colleagues from Diawling National Park on the Mauritanian side of the Senegal estuary also joined, as potential wintering habitats for Aquatic Warblers occur in their country.

The search for Aquatic Warblers started immediately. The few former records in the area were from cattail stands and from sedge, rush or reed vegetation in freshwater marshes or floodplains (Schäffer *et al.* 2006). Initially, therefore, efforts concentrated on *Typha* stands and on grassy and bushy savanna habitats, but no Aquatic Warblers were found. The search then shifted to wide flooded marshes with up to c.60-cm high grasses (*Scirpus maritimus*, *S. littoralis*, *Sporobolus robustus*) and few bushes. There, after seven days of search, the first Aquatic Warbler was mist-netted, on 25 January. Once the habitat preferences for the species were known, several birds were mist-netted almost every day and more were observed. The reason for the failure of former mist-netting projects within Djoudj National Park to capture more Aquatic Warblers was probably due to the species' special habitat preferences. Only a few other species were mist-netted in the marshes, in contrast to the bushes at their fringes, which were full of migrants—the target of most former projects. Mist-netting in homogeneous habitat with no shade, but knee-deep water that made it necessary to wear high gum boots revealed another surprise for the members of the AWCT: 16 Baillon's Crakes *Porzana pusilla* were captured and many more observed and heard. There were only two previous records from Senegal, but now it appears that an important wintering area was also discovered for this species.

Following two further weeks of mist-netting and observations, a total of 56 Aquatic Warblers had been captured—almost twice as many as the total number of winter records (November–February) to date. With this unexpected success, it was revealed that the region of Djoudj National Park appears to be one of the most important wintering areas of the species. In addition, more than 2,000 individuals of 22 other Palearctic migrants were mist-netted. All were ringed, standard measurements and blood samples were taken, and feathers were plugged. These samples will be analysed in the UK to garner knowledge as to the origin of those birds wintering in Djoudj National Park. Senegalese and Mauritanian AWCT members received training in ringing, to further the project. One of the mist-netted Aquatic Warblers had been ringed in Palencia, north-west Spain, during the preceding autumn migration.

The future—a model of successful inter-continental cooperation to protect globally threatened migratory species

Some areas where warblers were found are within the limits of Djoudj National Park and are therefore protected. There are, however, other sites outside the park, which may be threatened by grazing. Exploratory trips to northern Senegal have revealed that there is hardly any suitable habitat for Aquatic Warblers, due the transformation of natural floodplains of the Senegal River into arable land—a remarkable similarity to the threats on the European breeding grounds (Schulze-Hagen 1991, AWCT 1999, Poluda 2006). As the discovered wintering grounds appear safe, the main task for the AWCT will be to search for additional suitable habitats. These may occur in Mauritania, in Diawling National Park or around some lakes (Lac Aleg, Lac R'Kiz) in the south. Some preliminary work for further searches was made during the present trip: wherever Aquatic Warblers were mist-netted a detailed description of the habitat was made. Analyses of these descriptions, coupled with the use of satellite images, should reveal regions with similar habitats on which future searches can focus. Furthermore, analyses of the blood samples, and another study into isotopes of the collected feathers, may shed further light on which breeding population/s winter/s in the Djoudj area. Ringing recoveries may also help solve this question. In the latter case, the

habitat analysis may direct the AWCT to other potential wintering grounds in West Africa.

Another important result of the AWCT expedition was that ornithologists from many countries and two continents can work successfully together, to make a large step forward in the protection of a globally threatened species. This might encourage more countries to join the AWCT in its efforts, and also motivate international cooperation in other projects.

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^aMax Planck Institute for Ornithology, Vogelwarte Radolfzell, Schlossallee 2, 78315 Radolfzell, Germany. E-mail: salewski@orn.mpg.de

^bBretagne Vivante – SEPNEB, Trunvel, 29720 Tréogat, France.

^cDirection des Parcs Nationaux du Sénégal, Parc Forestier et Zoologique de Hann, BP 5135 - Dakar-Fann, Sénégal.

^dLandesumweltamt Brandenburg (LUA) Abt. GR, Tramper Chaussee 2, 16225 Eberswalde, Germany.

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